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BOARD OF NATURAL RESOURCES

UTILIZATION PLAN
MARYLAND MARINE PRODUCTS

THEODORE M. MILLER

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UTILIZATION PLAN
MARYLAND MARINE PRODUCTS

Economists predict a return to competitive markets, where the efficient survive and the inefficient cease to exist. Basic industries, faced with narrowing profit margins, have been quick to recognize the need of intensive rather than wasteful utilization of their raw materials. Fisheries, regardless of location, are becoming more and more subject to these same economic laws. No longer do isolated fisheries have exclusive local markets. The advantages of proximity are vanishing before the inroads of rapid transportation and modern refrigeration, and it behooves persons concerned with the welfare of Maryland fisheries to use every means possible to effect efficient, sound operations and, where possible, cleaner, tastier products. Intensive utilization of fishery waste materials in *by-products* may well be the determining factor in any profit and loss statement.

A somewhat general picture of Maryland fisheries and an estimate of their by-products potential can be gained by examining official Federal records.* The total 1942 catch of fin-fish in Maryland was 17,119,900 pounds, valued at $788,323. It consisted chiefly of the following: Alewives or Herring, 3,422,600 pounds; Croakers, 5,960,400 pounds; Sea Trout, 1,473,400 pounds; and, Striped Bass, weighing 2,507,800 pounds. The total catch of shell-fish during this period was 29,666,600 pounds valued at $3,300,867, consisting chiefly of Hard Crabs, 14,048,400 pounds; Soft and Peeler crabs, 1,645,300 pounds; and, Oysters, 13,767,700 pounds. During this same year, by-products, valued at $1,253,682 and consisting of such items as fertilizers, dry scrap, meal, poultry feed and burned and unburned lime, were produced. Manufactured products, including by-products, canned goods, smoked, salted or pickled fish, etc., derived to some extent from the catch of other states, totaled $5,424,183. Apparently, most fin-fish by-products produced within the State were derived from outside sources, large amounts of crab waste were dumped, and huge quantities of oyster liquors were thrown away.

*"Fishery Statistics of the United States, 1942," A. W. Anderson and E. A. Power, Statistical Digest No. 11, 1946, Fish and Wildlife Service.

There has been no appreciable change in this picture up to the present time. Moreover, there are practically no instances where inedible marine products, caught in conjunction with fishery operations, are being utilized. A conservative estimate would place the State's waste of apparently useful raw materials at somewhat more than 10,000,000 pounds per year.

It has been stated that Maryland landing points for fishery products are not adequately equipped for the collection of waste materials. This is far from true where there are canneries or filleting plants engaged in handling fish. During operating seasons, such plants have large quantities of waste materials which all too often are considered a nuisance and a total loss, even though there are ways of obtaining a substantial income from these. A profitable market can be developed for waste materials, and it is felt that more of them will be used, under increasing demands, than the processing plants can produce. The largest unused potential, within the State, consists of tons of fish, sold whole, even though approximately 50% of the body weight must eventually be thrown away by the consumer. There is ample evidence to indicate that many species of fish should be cleaned and wrapped before icing, and that the quality of the products delivered to the consumer would, thereby, be measurably improved. If these facts can be established, it would seem that individual fishermen, groups of fishermen, and other persons in the industry, will soon find the means of establishing landing point facilities for cleaning, wrapping, icing and waste material collection to augment their incomes, and at the same time to make available millions of pounds of waste materials for useful applications.

The short distances between points of catch and landing points, and the usual practice of making daily landings offer the interesting possibility of procuring fresh waste materials for use in industrial applications not feasible with partially decomposed substances. The statistical data contained in accompanying Plate I were determined by averaging 1944 and 1945 catch records gathered by the Department of Research and Education, and apply only to fin-fish caught by licensed commercial fishermen. They do not include shell-fish, or fishery products shipped to processing plants from other states. However, the data do strongly indicate the appreciable quantities of fin-fish caught and landed in relatively small areas. Ocean fishery

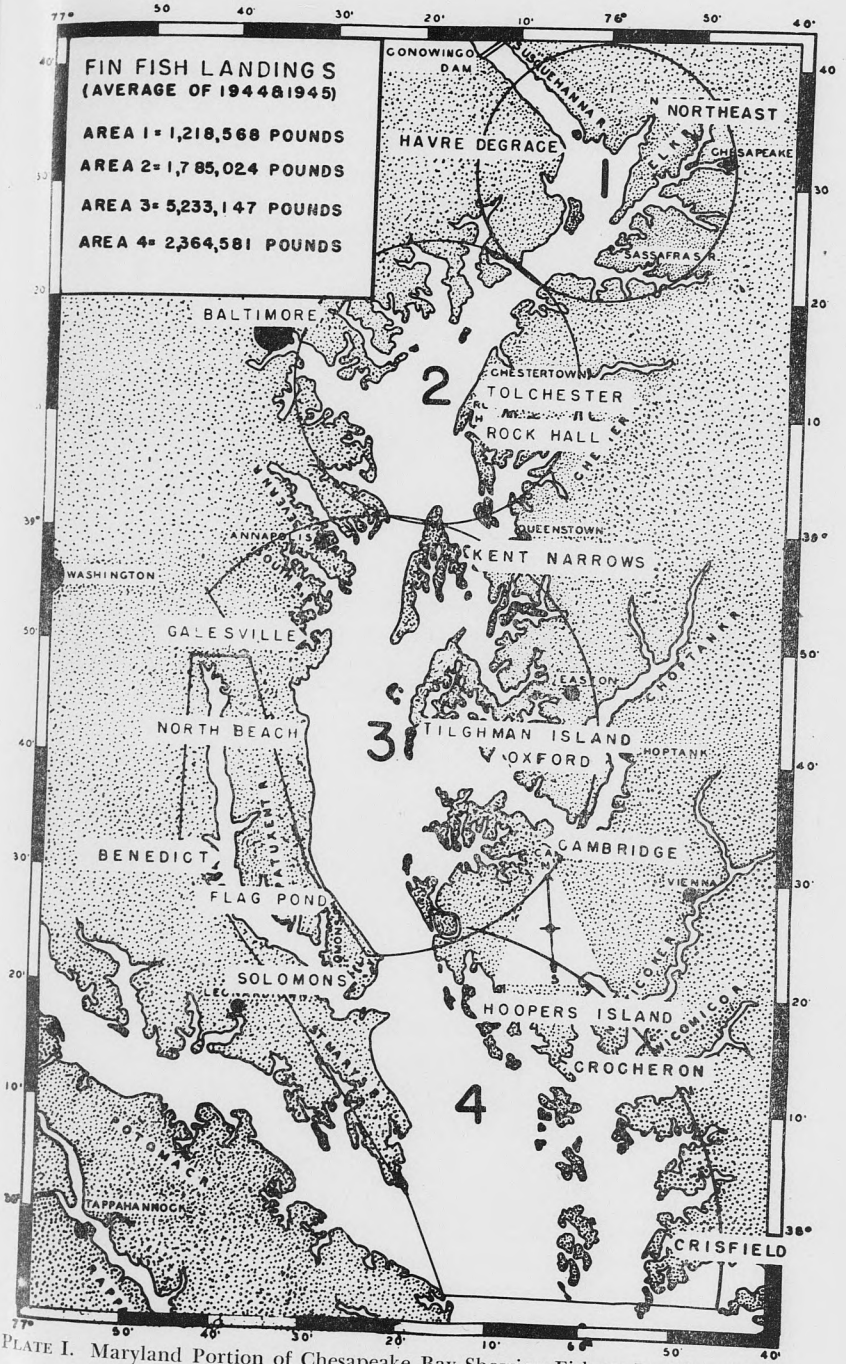

PLATE I. Maryland Portion of Chesapeake Bay Showing Fishery Landing Points.

landings at Ocean City (not shown in Plate I) during 1944 and 1945, averaged 3,305,609 pounds a year. In view of the quantities of materials unloaded at these landing points, it would appear

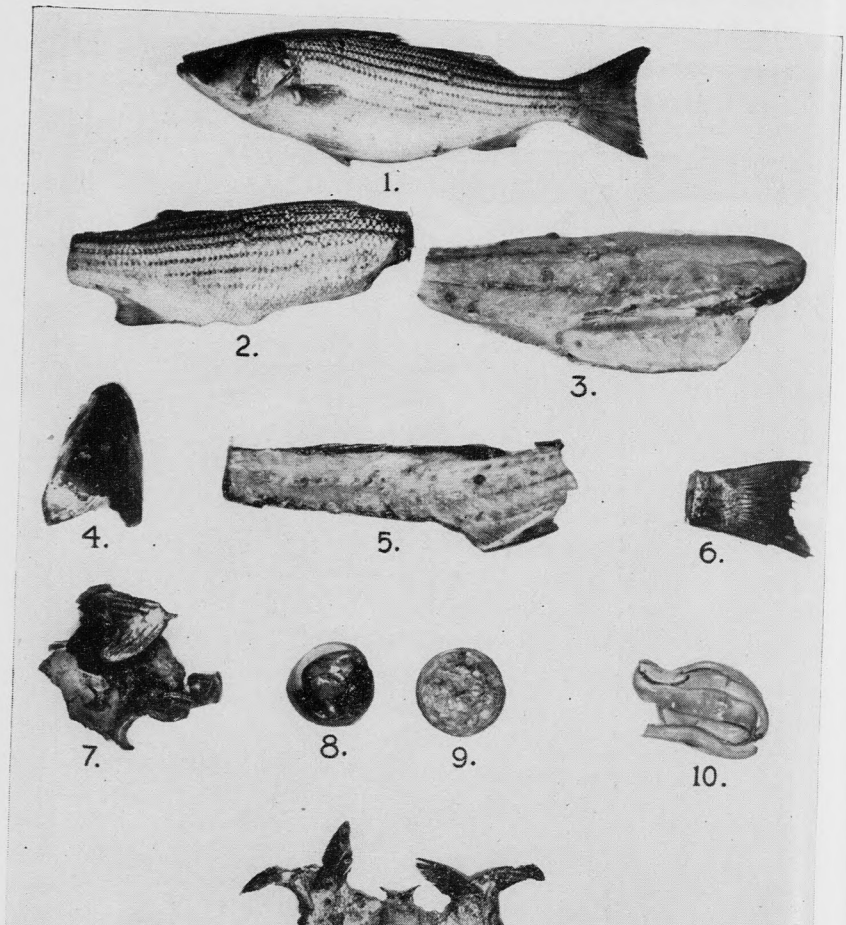

PLATE II. Fin Fish Raw Materials. 1. Whole Fish. 2. Gutted Fish. 3. Filleted Fish. 4. Head. 5. Backbone. 6. Tail. 7. Viscera. 8. Liver. 9. Scales and Skin Scrapings. 10. Gonads. 11. Trimmings.

feasible to establish small, adequate facilities for cleaning, wrapping, icing and boxing of fish, the waste materials to be separated, iced and shipped along with the catch.

The Utilization Plan for Maryland Marine Products presupposes a willingness to work together in developing the engineering details of collection facilities located at landing points, and in processing plants. Since a certain degree of standardization will be required if sufficient quantities of dependable raw materials are made available, this Department will work with fishermen, and with other groups, in collecting information concerned with:

1. Layouts for rapid cleaning and packaging of fish, prior to icing.
2. The wrapping of whole, gutted fish, prior to icing, to obtain as much improvement of quality as possible.
3. The preparation of routing schedules, based upon present pick-up systems, to permit consolidation of waste materials in quantities useful to manufacturers.

Assistance will be given both fishermen and processing plants in collecting information concerned with:

4. Classification and standardization of the various types of waste materials, such as those indicated in Plates II, III, and IV.
5. Methods and labor involved in separating the various constituents of fin and shell-fish waste materials.
6. Methods of preservation or special chemical treatments to be applied.
7. Percentage weights of various waste materials contained in each species.

It is anticipated that a uniform system of separating and collecting waste materials will result in dependable supplies of high quality materials.

Potential users of these waste materials include manufacturers of foods, pharmaceuticals, fine chemicals, chemical specialties, heavy chemicals, and those engaged in the process industries. A number of companies at present use raw materials derived from fisheries, and these will form an immediate market as soon as dependable sources of supply can be demonstrated. It is likely that many other manufacturers will become interested as soon as the potentialities are brought to their attention. The Plan is being made known through personal contacts, announcements in trade publications and by mail. Manufacturers are offered every assistance in finding uses for these raw materials, not only through samples, which may be ordered for experimental purposes, but also in the form of whatever technical assistance can be given them in working out special applica-

tions. In addition to the raw materials listed in the Appendix, attempts will be made to collect other marine products which seem to offer novel applications.

Summarizing some of the assumptions upon which the Utilization Plan for Maryland Marine Products is based, there are numerous indications that: (1) the fishery products are incompletely utilized, (2) serious inroads can and will be made by other fisheries whenever local operating costs, due to wasteful methods, become too high,

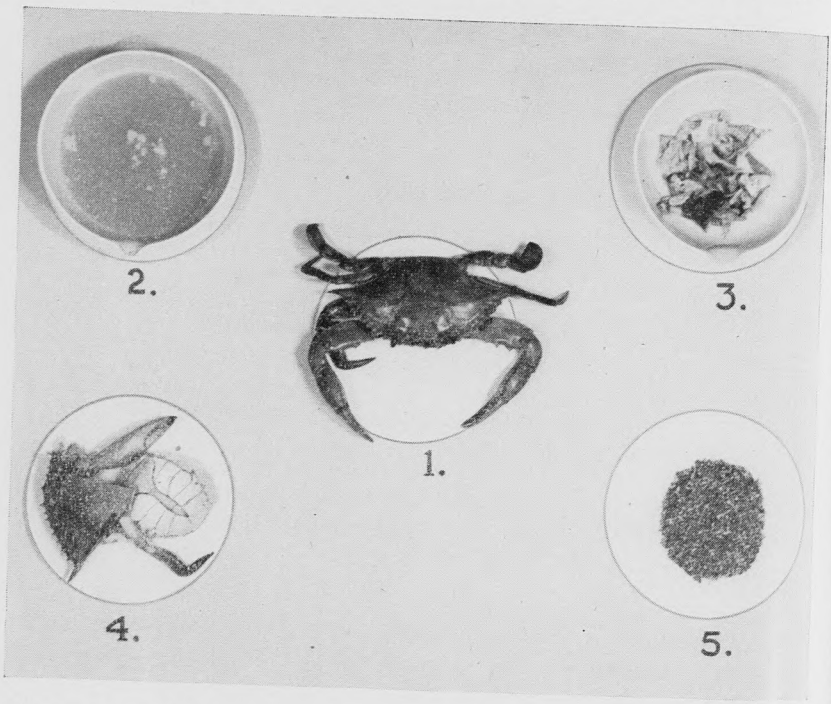

PLATE III. Crab Raw Materials. 1. Steamed Crab. 2. Cooking Liquors. 3. Steamed Viscera. 4. Shells. 5. Mixed Crab Waste.

(3) as a counterbalance to high operating costs, the State possesses a reasonably large waste material potential which can augment the income of fishermen and processors, and (4) these materials are distributed close enough to landing points to make their collection in fresh form an attractive possibility. It is further indicated that through cooperative effort, (5) there can be worked out a standardized method of collection and routing to manufacturers so that

Maryland raw materials for use in fishery by-products can become a real boon to industry. The Plan further offers manufacturers an easy means of obtaining experimental samples of fishery raw materials and suggestions regarding their use, so that a market can be developed concurrently, and in conjunction with the establishment

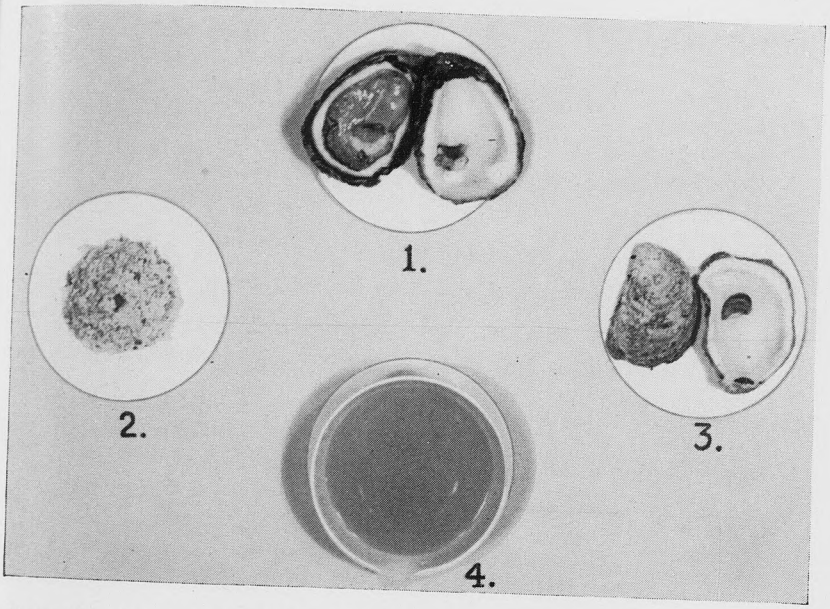

PLATE IV. Oyster Raw Materials. 1. Shucked Oyster. 2. Crushed Shell. 3. Whole Shell. 4. Liquors.

of waste material collection facilities. In conclusion, it may be stated that the coordinative function of this Department is a temporary expedient which it is hoped may be terminated at the earliest date and replaced by direct liaisons between the fishery and industry.

APPENDIX—*Utilization Plan*

RAW MATERIALS

A. Fish Heads
B. Fish Backbones
C. Fish Tails
D. Fish Viscera
E. Fish Livers
F. Fish Scales & Skin Scrapings
G. Fish Gonads
H. Fish Trimmings
I. Crab Cooking Liquors
J. Crab Viscera
K. Crab Shells
L. Mixed Crab Waste
M. Crushed Oyster Shells
N. Oyster Shells
O. Oyster Liquors
P. Eels
Q. Mussels
R. Bottom Sediments

INTERMEDIATES

(Letters Designate Raw Materials Used)

1. Industrial Fats and Oils—D,L
2. Edible and Medicinal Oils—E,G,J, P,Q
3. Nitrogenous Materials—A,B,C,E,F, G,H,I,L,O,P,Q
4. Enzyme Bearing Materials—D,E,G,R
5. Hormone Bearing Materials—G
6. Water Sol. Proteins, Vitamins, etc.—F,I,O
7. Shell Mixtures—K,L,M,N
8. Edible Fish Scrap, Cooked—H
9. Mineral Constituents—R

PRODUCTS

(Numbers Designate Intermediates Used)

Adhesives—3,6
Albumen—3
Amino Acids—3,6
Arginine—3,5
Bates for Leather—4
Cements—3,6,7
Caulking Compounds—3,6,7
Chowders—6,8
Cholesterol—1,2
Core Binders—1,3
Corrosion Inhibitors—1,3
Crude Amino Acids—3,6
Enzymes—4
Feeds—2,3,6,7,8
Fermented Protein—6,8
Fertilizers—3,6,7
Flourine Rich Foods—6,8
Guanine—3
Hormones—5
Lubricants—1
Metallic Soaps—1
Non-drying Oils—1
Oil Fortifiers—2
Paints and Varnishes—1,3
Peptones—3,6
Protein Preparations—3
Pigments—9
Resins and Plastics—1,3
Rubber Compounding Materials—1
Salad Dressings—2
Shortenings—2
Soaps—1,2
Sprays—1
Sulphonated Oils—1,2
Surface Active Agents—3
Synthetic Fibres—3
Tanning Oils—1
Thickening & Emulsifying Agents—1,3
Vitamin Concentrates—2,6
Wax Dispersions—1

MANUFACTURER'S ORDER BLANK

To: Department of Research and Education
Solomons, Maryland

Please send samples of RAW MATERIALS indicated below:

RAW MATERIAL	*Amt. in Gms.*	*RAW MATERIAL*	*Amt. in Gms.*
Fish Heads		Crab Cooking Liquors	
Fish Backbones		Crab Viscera	
Fish Tails		Crab Shells	
Fish Viscera		Mixed Crab Waste	
Fish Livers		Crushed Oyster Shells	
Fish Scales and Skin Scrapings		Oyster Shells	
		Oyster Liquors	
Fish Gonads		Eels	
Fish Trimmings		Mussels	
		Bottom Sediments	

The following Raw Materials, not listed above, are desired in the following amounts.....

SPECIAL INSTRUCTIONS: (To be outlined on other side of this page)

1. List species of fish, if there are special requirements.
2. Describe degree of freshness, method of preservation and special precautions to be taken with Raw Materials prior to shipment.
3. Describe containers and special precautions to be used in shipping.
4. Specify time limits for shipment, from collection until receipt at plant.

ADDITIONAL INFORMATION: (Optional—The following information will assist us in study)

5. List some possible uses for these Raw Materials.
6. What would be your average annual requirements of the materials requested?
7. Will seasonal fluctuations constitute a serious factor?
8. Can you suggest a fair price for commercial quantities of the Raw Materials?
9. Can you suggest some other manufacturers who might be interested in these Raw Materials?

Name of Manufacturer.....

Address .....

Represented by..... Title.....

Date.....

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